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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/544,216	08/01/2005	Johan Hendrik Klootwijk	NL03 0089 US1	9481
65913	7590	04/03/2009	EXAMINER	
NXP, B.V. NXP INTELLECTUAL PROPERTY DEPARTMENT M/S41-SJ 1109 MCKAY DRIVE SAN JOSE, CA 95131			NADAV, ORI	
			ART UNIT	PAPER NUMBER
			2811	
			NOTIFICATION DATE	DELIVERY MODE
			04/03/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

Office Action Summary	Application No. 10/544,216	Applicant(s) KLOOTWIJK, JOHAN HENDRIK	
	Examiner Ori Nadav	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

In view of the appeal brief filed on 12/24/2008, PROSECUTION IS HEREBY REOPENED. A new rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

/Lynne A. Gurley/

Supervisory Patent Examiner, Art Unit 2811

Response to Amendment

The amendment to the claims filed on 06/03/2008 has been entered.

Claim Objections

Claim 5 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claimed limitations of “trench isolation structure, comprising: a slab of semiconducting material having a surface and a buried layer which extends parallel to the surface”, as recited in claim 1, are unclear as to how a trench isolation structure can comprise a slab of semiconducting material and a buried layer, since the slab of semiconducting material and the buried layer are located outside the boundaries of the trench isolation structure and are not part of the trench isolation structure.

The claimed limitation of “a first part of the trench groove is completely filled with the first insulating material”, as recited in claim 3, is unclear as to how a first part of the

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trench groove can be completely filled with the first insulating material, since the liner has a thickness, in the first part of the trench groove, that is substantially in line with the upper and lower surfaces of the buried layer, and that is larger than a thickness of the liner in a second part of the trench groove.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, as best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Goth et al. (4,589,193).

Goth et al. teach in figure 9 and related text trench isolation structure, comprising:

a slab of semiconducting material having a surface and a buried layer 12 which extends parallel to the surface, the buried layer having an upper surface and a lower surface; and

a trench groove extending at least from the surface through the buried layer down to a part of the slab below the buried layer and

the trench groove including a liner 17 (or 18) of a first insulating material on a wall of the

trench groove, and

wherein a remaining part of the trench groove is at least partially filled with a first filler material 27, and

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wherein in at least a first part of the trench groove, the liner has a thickness that is substantially in line with the upper and lower surfaces of the buried layer, and that is larger than a thickness of the liner in a second part of the trench groove (the bottom edge of liner 17 or the area where liner 18 does not reach the bottom of the trench), the second part of the trench groove located below the first part.

Regarding claim 2, Goth et al. teach a thickness of the liner 17 in the first part of the trench groove is larger than a thickness (zero thickness) of the liner in a third part of the trench groove (the top area in the left trench where liner 17 does not reach the height of liner 18, the third part of the trench groove located above the first part of the trench groove,

Regarding claims 1 and 2, Goth et al. teach a liner has a thickness that is larger than a thickness of the liner in a second part of the trench groove wherein the second part of the trench groove located below the first part, and a thickness of the liner in the first part of the trench groove is larger than a thickness of the liner in a third part of the trench groove wherein the third part of the trench groove located above the first part of the trench groove, for the following reasons. The claims recite a liner and a first insulating layer filling the trench groove. The claims do not state that the liner and the first insulating layer comprise two different materials. Therefore, forming the liner and the first insulating layer of the same insulating material renders the boundaries between the liner and the first insulating layer indistinguishable from each other. Arbitrarily choosing

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the boundaries between the liner and the first insulating layer such that the liner has a thickness that is larger than a thickness of the liner in a second part of the trench groove wherein the second part of the trench groove located below the first part, and a thickness of the liner in the first part of the trench groove is larger than a thickness of the liner in a third part of the trench groove wherein the third part of the trench groove located above the first part of the trench groove, as claimed.

Note that forming the liner and the first insulating layer of the same insulating material such that the liner has a thickness that is larger than a thickness of the liner in a second part of the trench groove wherein the second part of the trench groove located below the first part, and a thickness of the liner in the first part of the trench groove is larger than a thickness of the liner in a third part of the trench groove wherein the third part of the trench groove located above the first part of the trench groove, these are process limitations which would not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced.

Note that a “product by process” claim is directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and *In re Marosi et al.*, 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a “product by process” claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in

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“product by process” claims or not. Note that the applicant has the burden of proof in such cases, as the above case law makes clear.

Regarding claim 3, Goth et al. teach a first part of the trench groove (arbitrarily chosen) is completely filled with the first insulating material.

Regarding claims 4 and 5, Goth et al. teach in figure 9 and related text the first part of the trench groove (arbitrarily chosen) extends substantially in line with the buried layer, and

a semiconductor assembly, comprising a trench isolation structure according to claim 1, and at least one semiconductor device present on the surface of the slab of semiconducting material, wherein the semiconductor device is insulated by means of the trench isolation structure.

Response to Arguments

Applicant's arguments with respect to claims 1-5 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ori Nadav whose telephone number is 571-272-1660.

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The examiner can normally be reached between the hours of 7 AM to 4 PM (Eastern Standard Time) Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne Gurley can be reached on 571-272-4670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Lynne A. Gurley/
Supervisory Patent Examiner, Art Unit 2811

O.N.
4/1/2009

/ORI NADAV/
PRIMARY EXAMINER
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